

MONTESSORI SPECIAL EDUCATION AND NATURE'S PLAYGROUND

by Nimal Vaz

Nimal Vaz takes us to the essentials of Montessori as an aid to life for all children, particularly children with special needs. She challenges teachers to truly provide experiences in nature: observing anthills, identifying bird nests, or taking an olfactory walk with a legally blind classmate. Finally, she demonstrates how a child's interest in practical life, math, language, sensorial, biology, botany, geology, and geography originates with direct experience in nature.

UNDERSTANDING SPECIAL NEEDS

The phrase *special needs* refers to the educational requirements of a child who is outstanding in a particular capacity. The term is valid in that the children we have in mind deviate from the average and need special understanding and care. The term is used loosely today to include all children who differ from the norm. It applies to the mentally retarded, the physically handicapped, the emotionally handicapped, those with cerebral palsy, autistic syndromes, learning disabilities, ADD, ADHD, as well as the gifted child.

Do we want to slap any of these labels on our children?

"Why isn't this child who appears to be of normal intelligence learning to read?"

"Well, because he has a learning disability."

"But how do you know that he is learning disabled?"

"Because he appears to have normal intelligence but he isn't learning to read."

This is a type of circular reasoning known as *reification* (Payne 32). The danger in this type of sloppy thinking is that it prevents children from being helped. Special needs children have suffered too many indignities and have waited too long for effective education for us to play word games.

We who work with this child have to understand that this is a child first, the specialty second, if he is to succeed. This is the greatest need of the special

child. In Montessori we have so much to offer this child because for us education is an aid to life.

As you all know, Montessori worked with these special children from 1898 to 1900. She writes in her book *The Discovery of the Child*:

I had the intuition that the methods of Séguin were not merely an attempt at helping inferior beings, mentally defective children, but they were based on principles far more reasonable than those in use in ordinary education. Here indeed the result was not only that the pupils "learned something," here one witnessed an awakening of the personality. (25)

Montessori goes on to tell us this method of educating these children was different from the methods used in regular schools of the day (also today). But the "methods" were not particular to an "inferior mentality," meaning special needs children.

On the contrary these different methods contain a system of mental treatment that was very logical and superior to that being empirically applied to normal children. Slowly I became convinced that similar methods to normal children would lead to a mental awakening and a beneficial modifying action in them also. I had in fact come upon an experiment of scientific pedagogy! (25)

This is why an integration of the special needs child in a class of normal children is possible. Montessori tells us:

It is possible to draw comparisons between defective [special needs] and normal children if we consider children of different ages, that is, compare those who have not the power to

develop (defectives) with those who have not yet had time to develop (very small children). Backward children are judged mentally as being children whose mentality closely resembles that of normal children some years younger. In spite of the fact that in such a comparison there is lacking the consideration of initial force innate in such differing degrees in the two natures, the comparison is not illogical. (36-37)

So, for Montessorians to integrate the special needs child with the normal child seems to be a perfectly sensible thing to do.

THE IMPORTANCE OF NATURE

But what has nature got to do with education? Why is nature so important for the young child? It is because man is both a spirit and matter. The young child, as Montessori tells us, is both a physical embryo and a spiritual embryo. For the spirit to soar, for the creative mind to take off, the material body must be firmly grounded in reality. Nature is real—there are controls of error in nature that keep us on the correct path on our journey from the concrete to

the abstract. If the mind is not grounded in reality, it wanders in the realms of fantasy and illusion.

Today's children are alienated from nature. Therefore, we as adults need to explore avenues for providing environments in the midst of nature for the young child or for bringing nature into our environments.

Dr. Montessori has been called the greatest naturalist, as well as the greatest ecologist of all time. Her impression is that an appreciation of God and man should be the essence of education. Montessori was of the opinion that each living being takes something from the environment, but each gives much more than it takes. These are the natural connections.

Chief Seattle of the Northwest Nations, speaking to the government in Washington, DC, who wished to buy the lands of Chief Seattle's people, asked, "How can you buy the sky? How can you own the rain and wind? My mother told me every part of this Earth is sacred to our people.... My



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ancestors said to me, this we know. The Earth does not belong to us. We belong to the Earth" (cited in Jeffers n.p.).

So it is with the little child—the child's place, his environment should be the natural environment. He belongs to the Earth.

Today, the world of adults seems to have missed this natural connection—children almost from the time of birth live lives alienated from the natural world. In *The Discovery of the Child*, Montessori writes, "In our time and in the civilized environment of our society, children however live very far distant from nature, and have few opportunities of entering into intimate contact with it or of having direct experience with it" (98). Richard Louv's book *Last Child in the Woods* describes the accumulating research that reveals the necessity of contact with nature for healthy child and adult development:

Our society is teaching young people to avoid direct experience in nature. Rapidly advancing technologies are blurring the lines between humans, other animals, and machines. The postmodern notion that reality is only a construct—that we are what we program—suggests limitless human possibilities, but as the young spend less and less of their lives in natural surroundings, their senses narrow, physiologically and psychologically, and this reduces the richness of human experience. (2-3)

Dr. Montessori continues:

Nature has, little by little, been restricted in our conception to the little growing flowers, and to the domestic animals which we depend on for food, for labour, or for defence. Besides that, our minds have been shrunk, have adapted themselves to harbouring contrasts and contradictions, have even confused the pleasure of looking on animals with that of being near the poor creatures destined to die in order to feed us, or that of admiring the song and beauty of birds imprisoned in little cages—a kind of nebulous "love of nature." Does there not also exist the belief that by transporting a little sea sand to some receptacle like a tray one is giving immense assistance to children? Very often it is imagined that the sea-shore is educational because sand is found there as in the receptacle. And so within the confusion of this world prison of ours, we arrive at the most unnatural conclusions. (99)

Nature, as Montessori remarks, frightens most people. Even today primitive society is fearful of natural phenomena. On first viewing the glory of creation—primitive man's first impulse was fear.

Most people dread the air and sunshine and the earthly soil, "dirt" as it is called in American society. Children are constantly admonished, "Do not get dirty." "Do not remove your socks and shoes and go into the sandbox." How else is the child to experience the sand and the soil? To know is to love.

Montessori tells us:

Set the children free, let them have fair play, let them run out when it is raining, take off their shoes when they find pools of water, and when the grass of the meadows is damp with dew let them run about with bare feet and trample on it; let them rest quietly when the tree invites them to sleep in its shade; let them shout and laugh when the sun wakes them up in the morning, as it wakes up every other living creature which divides its day between waking and sleeping. (100)

Writing in *The Formation of Man*, Montessori referred to a subconscious pattern in society:

An *Organization* of evil (*Male*) has been formed which assumes the semblance of good (*Bene*) and is *Imposed* on the whole of humanity (*Umanità*) by *Suggestion*; when we combine the initials of these characteristic words and form a word, we then get: OMBIUS.... The social ombius dominates the child. (50-51)

Adults think they know what is good for the child, what the child needs. Adults, in this way, misguidedly conclude that children are happy playing in specially contrived sandboxes and playscapes structured by the adult mind for children. The joys of exploring and climbing a tree are lost—adults also think that children take pleasure in seeing caged birds and animals. Montessori writes in *The Discovery of the Child*, "When, having been kept in restraint by us, having been degraded and irritated by the prison, the child kills insects and other harmless animals, it seems to us natural; we do not realize that this mind has already become estranged from nature" (101).

In the twenty-first century, modern man is losing this bond with nature. We as Montessorians need to be able to rise above the ombius to get ourselves out of this box, to shake off our paradigm paralysis and to return the child to nature in our own prepared environments.

When we study the lives of many creative and gifted individuals—mathematicians, artists, physicists, poets—we see that as children, they explored and enjoyed nature. My recent reading or re-reading

has included *The Pleasure of Finding Things Out* by Richard P. Feynman (who won the 1965 Nobel Prize in physics for his many contributions to physics, especially quantum electrodynamics), *In the First County of Places* by Louise Chawla, *Last Child in the Woods: Saving Our Children from Nature-Deficit Disorder* by Richard Louv, *The Sense of Wonder* by Rachel Carson, photographs by Nick Kelsh, as well as *String, Straightedge, and Shadow: The Story of Geometry* by Julia Diggins. All these authors comment on the importance of nature as forming the construction of the mind, as does Montessori—which is why nature is so important to our special children.

A common thread that runs through these books is that there is always a caring adult who draws the child's attention to the value of the world of nature. Richard Feynman tells us about his father taking him for walks in the woods and telling him what was going on in the woods—not just naming the birds and the trees. Feynman says his father in this way taught him to really notice and observe things and then perhaps discuss and question his observation. This was one way of developing intelligence, his ability to find things out himself (4).

In *A Sense of Wonder*, Rachel Carson tells us, "Exploring nature with your child is largely a matter of becoming receptive to what lies all around you. It is learning again to use your eyes, ears, nostrils, and fingertips, opening up the disused channels of sensory impression (67).

Writing in *Spontaneous Activity in Education*, Montessori tells us it is the quality of being able to observe nature in great detail and, more importantly, of being able to get the child excited about these observations that will help the child come to his own conclusions. This is the idea behind the Montessori dictum of "give the child a key to the universe."

BIOLOGY AND THE PREPARED ENVIRONMENT

We need to remember that the child aged three to six in the Children's House, normal and special, still has the absorbent mind, and the sensitive periods are working overtime. Today we know for a certainty because of the new brain discoveries that the brain development of infants and toddlers proceeds at a staggering pace. By the age of two, the number of synapses reaches adult levels; by the age of three a child's brain has one thousand trillion synapses, about twice as many as an adult. This number

holds steady through the first decade of life. After this time, a process of pruning begins—the brain selectively eliminates excess synapses.

How does the brain "know" which connections to keep and which to discard? This is where early experience plays a crucial role. When some kind of a stimulus activates a neural pathway, all the synapses that form that pathway receive and store a chemical signal. Repeated activation increases the strength of that signal. When the signal reaches a threshold level (which differs for the different areas of the brain) something extraordinary happens to the synapse. It becomes exempt from the elimination and retains its protected status into adulthood. Scientists do not yet fully understand the mechanism by which this occurs, but they conjecture that the electrical activity produced when neural pathways are activated gives rise to chemical changes that stabilize the synapse.

These findings confirm that brain development is a "use it or lose it" process—so important to the special needs child. As the child gets older, the pruning accelerates. But those synapses that have been reinforced by virtue of repeated experience tend to become permanent, while the synapses that were not used often enough in the early years tend to be eliminated. In this way, experiences—positive or negative—that young children have in the first years of life influence how their brains will be wired as adults.

We as educators of the primary child in the first plane of life are so blessed, because we are in the fortunate position of helping the children's synapses grow. This is the age when interest becomes fixed and here is our chance to get these brains hooked on nature by preparing an environment for the children that relates richly to the natural world.

Montessori was a scientist, and much of her intuitive knowledge of young children came to her from biology. She tells us that nature prepares environments for the young and cites as examples the anthill, spider web, bird nest, and so on. She discovered through her observations that the young child, being both a physical and spiritual or mental embryo, will require an environment containing things that will help both his physical and mental life. Many adults will say at this point that we do have beautiful environments for the children at home and in traditional day care or

preschool experiences for young children. Infant toys, furniture, etc., are more and more attractive; however, these are designed by adults who, I feel, have not sufficiently observed young children to know what they need.

Montessori's genius lies in the fact that she was able to combine the principles of science and philosophy into a comprehensive system of education known as the "Montessori Method," central to which is the "prepared environment" for the primary child. Unfortunately, the principle of combining education and science has been elusive to the American public. As the head of Columbia University's Teachers College tells us, "At this moment philosophy is central to education. Equally important in the future will be biology" (cited in Kantrowitz & Winger 45). For us Montessorians, the future is now.

The Montessori prepared environment is a beautiful example of the philosophy-education principle—combined with the latest scientific discoveries—overseen by an educated, intelligent adult. Yet there are people who ask today, "Is a

prepared environment really necessary for the young child below the age of six? Wouldn't it be better for them to run around in the fresh air unfettered in gardens and be free?" Montessori's answer is that if this were the case, if what the young child needed was freedom to run about and lie in the sun, children may as well be cats or lizards.

The second answer to this question is that often today there is no loving adult at home to take care of the young child. The fresh air is polluted. Very few homes have yards or gardens the child can run around in. Adults are also afraid to let children wander outdoors on their own.

The third answer is that the present-day home is not geared to the child. The furnishings, the rhythm, the tempo of the home are usually geared to the adult. There is very little for the child.

The child of this plane is an explorer, like early man; everything is new to him. So Montessori set about building an environment for this child in the beginning though trial and error. She finally came



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to understand that this environment had to be made up of three parts:

- The child in the first plane of development with his absorbent mind, sensitive periods, and human tendencies.
- The adult—trained as an observer of the child and his needs.
- The physical space.

As such, physical space of the Montessori prepared environment will contain:

- The material necessary for carrying out the exercises of practical life.
- The sensorial materials.
- The language and math materials as well as extensions of the language, to include geography, geology, botany, biology, history, science, music.
- Those things necessary for the development of the religious and moral life.

Finally, the Montessori prepared environment is based on six basic principles:

- The concept of freedom.
- Structure and order.
- Reality and nature.
- Beauty and atmosphere.
- The Montessori materials.
- The development of community life.

We will not discuss each of these in depth at this point. We will only talk about those areas that directly pertain to this lecture.

THE EXERCISES OF PRACTICAL LIFE AND NATURE

So we begin with practical life—we all know what these exercises are. They are the very breath of the Montessori environment, the foundation of the Montessori program. Broadly, these are classified according to:

- Movement exercises—elementary and advanced
- Exercises for the care of the person
- Exercises for the care of the environment

- Grace and courtesy exercises to help oil the wheels of society as well as to learn the ground rules of the prepared environment and the rules of human behavior.

Montessori goes on to tell us that the practical life exercises are best done outdoors. In this way the exercises will help the blood circulate more freely and help the lungs breathe in fresh air. She also lets us know that these exercises are the only real and proper gymnastics. The gymnasium is the environment the children live in. Rolling a rug, brushing shoes, washing a table, sawing wood, digging in the garden, raking leaves are all exercises in which the whole body is engaged. The constant movement of rolling, polishing, cutting, digging, sawing, etc. helps the child move its arms and hands to strengthen the muscles in a better way than by usual gymnastics. The exercises of practical life are also work.

My trainer, Miss Lena Wikramaratne (full disclosure: she's my aunt), used to say:

Until very recently the need for training in muscular movement at the pre-school level was not at all considered in education. The increasing lack of motor-visual coordination became more and more apparent in the kindergarten classes. With this there came to be noticed a lack of hand-eye coordination which in turn resulted in deficiencies in speech, reading and writing. So remedial efforts began to be taken which again were confined to the artificial gymnasium and exercises with man-made structures such as measured stairs, fixed trampolines and steel climbing frames. This training, like that used for caged animals in a zoo, does not allow for observing, thinking or judging distances or heights. In the world of nature there is scope for the perceiving and thinking mind in coming up against the unexpected and exercising the senses and muscles. These naturally help develop coordination and integration and enhance the powers of the intelligence. (29)

The walking on the line exercises done outdoors as well as the silence exercises in nature are invaluable to the special child. Play listening games outdoors. Rachel Carson says, "I believe children can be helped to hear the many voices of the Earth and what they mean—the majestic voice of thunder, the winds—the sound of surf, or flowing streams, and the voices of living things. No child should grow up unaware of the dawn chorus of the birds in spring" (84).

THE SENSORIAL MATERIALS AND NATURE

Let us talk about the sensorial materials. Montessori's view is that every young child who walks into our environment is like early man. The child moves through the same process of discovery from concrete material to the abstract. Montessori's genius lay in the fact that she could take the abstract concepts and put them into concrete form in the sensorial material. Our role as intelligent guides of these children is to help them discover and explore the world of nature using the materials as a key.

The child absorbs many impressions of sound, taste, color, smell, and touch by living in the world. He wants to explore the world. He is constantly bombarded by sensorial impressions. Montessori tells us "give the child the world," which seems impossible until we understand that in the first *Casa dei Bambini* she incarnated the qualities of the world, the colors, dimensions, shapes, sounds, touch, and taste, in the Montessori materials. The materials were not developed to give the child new impressions, but to order the impressions already received.

Take the children on walks so they can see flat land, the horizon in the distance, which is a straight line, a *horizontal* line; the zigzag lines of mountains; the serpentine lines of rivers and streams. Children can see vertical lines of trees, cylinders in tree trunks and branches, spheres in fruit on trees. You will be amazed at the new discoveries the children make.

The trays of the geometric cabinet taken outdoors will help the children see circles, right-angled triangles, squares, hexagons, and spirals beautifully revealed in earth and sky.

Children enjoy looking at rocks and crystals. Once a rose quartz broke in my class, and the children were amazed to see that the pieces, big and small, revealed the same inner structure when examined with the magnifying glass. All crystals of a given mineral have the same inner lattice structure.

When a fish in the aquarium dies, we fish it out to study its parts in greater detail. The children examine the parts of a fish using a magnifying glass and then draw and color it.

The botany cabinet, with the leaf shapes, is a piece of equipment made for nature study. Children enjoy searching for leaves to match the contents of

the cabinet. From here it is easy to go on to fruit and flowers in the environment. The petals of an iris open into hexagonal blossoms, the calyx of the rose into a five-pointed star. This leads to discovering the secrets of beauty in the symmetry and harmony and variety of nature's forms.

This in turn leads to the categorization and classification of smells and taste according to the smelling and tasting jars.

This year we have in our environment a legally blind, special-needs child. She enjoys the nature walks so much. Rachel Carson tells us, "Senses other than sight can prove avenues of delight and discovery, storing up for us memories and impressions"—so true in this child's case. "The sense of smell, almost more than any other, has the power to recall memories, and it is a pity that we use it so little" (83).

The child in the Montessori prepared environment may not use the sensorial materials until he has had a presentation in the correct use of the materials. It is only then that he can pass from the known to the unknown, the concrete to the abstract. To help this passage, the young child should be encouraged to explore the prepared environment, using the sensorial material as "keys." Where can we find "spheres" in the indoor and outdoor environments? Where do we see linear leaves? Can we smell a scent in the garden similar to one in the smelling bottles? These activities, plus the memory games, help the child to grow intellectually by making connections with nature, the world we live in. This is education for life.

THE MATHEMATICS MATERIALS AND NATURE

As Dr. Montessori often remarked, geography, biology, and mathematics are not in books. When man gathered knowledge of these, he was able to put it into the symbols of words, signs, and illustrations. With the invention of printing, all of these facts are now recorded in books. But knowledge must not be separated or isolated from the world of nature, which is and has been the source of all man's experience. The modern child is forced to imbibe only the results of that experience and so loses interest. This emphasizes one of the basic defects in the present teaching system—imparting knowledge for performance rather than for "interest." Interest cannot be aroused by extraneous propulsion because it is an inner desire, welling up from an innate positive feeling that stirs within. Interest grows in the individual



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who is in harmony with the natural tendencies of the human spirit in tune with nature.

Each one of us has a mathematical mind. It is sometimes called our sixth sense. When you enter a room and notice a picture on the wall hanging crooked and adjust it, you have used your innate sense of measurement. When you shut your ears to loud sounds you express a desire for harmony.

Animals have a natural sense of direction and distance. Spiders, who never studied engineering, spin an almost perfect spiral web. Most birds observe the principles of symmetry in the structure of a nest. The child of man needs to be introduced to these facts of nature and be allowed to discover for himself and explore the wonders of the natural world, always keeping in mind that mathematics is not in books.

Early man used his human tendencies to judge, reason, and calculate, among other things. The young child, working through the practical life and sensorial material, gains the necessary skills to work with the mathematical materials. These skills are to order, to be exact and precise, to calculate, and to repeat to perfection.

It is our duty, then, as adults to see that the child has a chance to practice these skills of everyday living in the prepared environment. We have silverware and dishes for the child to classify and order, laundry to be folded precisely and exactly, to calculate how many place settings are needed for lunch. Repetition of these skills naturally leads to perfection. When we take the child outdoors the child will be able to see, as early man did, mathematics—in dimensions, shapes, measurements, by walking the field (how many steps?), by observing shadows. This work makes mathematics fun for the child instead of memorizing “dry facts” from a book.

When this is done, these sensorial explorers will be able to begin their journey of mathematics from the concrete to the abstract through manipulation, experimentation, and invention.

THE LANGUAGE MATERIALS AND NATURE

Language has been called the greatest abstraction of man. Its main purpose is communication. The Montessori language material focuses on its two aspects, spoken language and written language. Once again keeping in mind that this young child is an explorer of the prepared environment, the adult should be ready with enough spoken language lessons for the enrichment of vocabulary in both the indoor and outdoor environments.

My fellow AMI trainer, Dr. Annette Haines, takes the view that the adult is the largest piece of language material in the environment. The richness and quality of the language program is determined by her.

Language training exercises that include stories, poetry, pictures, discussions, and general topics of interest should be a daily adventure for this child. Nature walks, where the adult can relate interesting stories of the natural fauna and flora, habitats of birds and animals, are invaluable. Mario Montessori used to call these “rambles” in nature. This is what the

young child will remember in later years, the joyful discoveries he made while on these rambles.

Written language is introduced as a parallel exercise, beginning with sound games and sandpaper letters, leading to reading and writing creatively and ending in sentence analysis. The teaching in Montessori is done indirectly, so it is of interest to the child if the adult writes a caption for each picture (preferably nature picture) on the wall and a short list of words from the picture to be placed next to it.

It is wise to remember that creative writing depends so much on the child's experiences. So the prepared environment should have many experiences: "hands-on" experiences relating to nature for the child in the "language extension" work extending to exploration in geography, geology, art, music, and science.

To quote Miss Lena Wikramaratne again: "Dr. Montessori says, 'Peace is what every human being is craving for, and it can be brought about by humanity through the child.'" The adult's role here is to encourage the child in his intellectual growth and make sure this formation is fed by "active experiences in the real world to which each [child] is led by the laws of nature" (31).

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